

patients emerge, based not on their skeletal level of injury but on remaining functional resources, both motor and sensory. These groups are the following:

- *Group I patients* (25 percent) have elbow flexion but no or only very weak wrist extension. For an occasional patient, wrist arthrodesis will simplify the type of orthosis from one applied by an aid to one self-applied. Orthosis must remain the basis of treatment.

- *Group II patients* (50 percent) have functional sensibility and strong wrist extension or may attain this through tendon transfers. For this largest group of patients, a strong key pinch between thumb and index can be reconstructed in one surgical procedure for one or both extremities. These patients may benefit from deltoid to triceps transfer to allow precise arm placement. The other digits are left supple for human contact. This is a radical departure from earlier therapy employing multiple joint fusions which frequently resulted in stiff clawed hands.

- *Group III patients* (25 percent) have multiple motor and sensory resources. More refined functions of digital grasp and thumb opposition are possible, though usually requiring multiple procedures. These patients may be functioning at a reasonable level already.

The keys to good therapy include (1) proper timing of surgical operation, generally following stabilization and good psychological adjustment to the injury; (2) individual evaluations to identify motor and sensory resources; (3) carefully done surgical procedures in selected patients, and (4) skilled physical and occupational therapy following operation. Today, 75 percent of quadriplegic patients are candidates for some upper limb surgical reconstruction.

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#### REFERENCES

Moberg E: Surgical treatment for absent single hand grip and elbow extension in quadriplegia—Principles and preliminary experience. *J Bone Joint Surg* 57:196-206, Mar 1975

Zancolli E: Surgery for the quadriplegic hand with active, strong wrist extension preserved—A study of 97 cases. *Clin Orthop* 112: 101-113, Oct 1975

## Subcutaneous Mastectomy

BREAST CANCER will develop in one out of every 13 women, and by the time the diagnosis is made axillary metastasis will already have occurred in 25 percent to 50 percent of these women. These depressing facts have popularized carrying out subcutaneous mastectomy as a possible prophylactic

procedure in patients at high risk of developing breast cancer. Since 1974 more than 3,000 subcutaneous mastectomies have been done.

Subcutaneous mastectomy is the removal of all visible glandular breast tissue with preservation of the overlying skin and subcutaneous tissue with or without the nipple and areola. The breast is reconstructed with a silastic prosthesis either immediately or as a delayed procedure.

The major objection to subcutaneous mastectomy is the inability of the surgeon to remove all the breast tissue. With experience however, it is possible to do an extensive procedure taking what appears to be the entire subcutaneous breast, including the axillary tail. Occurrence of carcinoma after subcutaneous mastectomy has been reported and, therefore, the operation must be thorough. It is not a cosmetic operation and must not be compromised to obtain a more esthetic result.

Patients must be carefully selected, well informed and properly motivated for the procedure. The surgeon must be thoroughly familiar with the prophylactic approach to premalignant breast disease so he can inform the patient of the positive and negative aspects of the procedure, the complications and unesthetic results that can occur.

Immediate reconstruction gives the best cosmetic result, but usually should be limited to small and medium size breasts when the amount of subcutaneous fat and the circulation are adequate. Breasts that are ptotic, thin skinned with striae or have multiple biopsy scars are best managed with a delayed implantation weeks to months later. Large pendulous breasts require reduction of the skin flaps and transfer of the nipple either on a pedicle or as a free graft. Placement of the implant under the pectoral muscle is preferred by some surgeons because of the increased vascularity to the skin flaps.

The most frequent complication is skin necrosis necessitating removal of the implant. If this occurs the implant usually can be reinserted at a later time. Capsular contracture around the implant may occur requiring surgical release.

At present subcutaneous mastectomy is done very selectively for indications which include the following:

- Multiple persistent breast nodules in premenopausal or postmenopausal women.
- A biopsy specimen of the breast that shows

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intraductal hyperplasia, papillomatosis, lobular hyperplasia or carcinoma *in situ*, noninvasive intraductal or ductal carcinoma.

- A positive family history of breast cancer in a patient who has progressive breast nodularity.
- Increasing anxiety of the patient and her doctor relative to bilateral persistent or increasing breast nodularity.
- Proven malignancy in one breast and nodularity or cystic disease in the opposite breast.

- Suspicious findings on a mammogram in a patient with bilateral nodular breasts.
- Mastodynia, in very carefully selected patients.

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### REFERENCES

- Pennisi VR, Capozzi A: Treatment of chronic cystic disease of the breast by subcutaneous mastectomy. *Plast Reconstr Surg* 52:520-524, Nov 1973
- Pennisi VR, Capozzi A, Perez FM: Subcutaneous mastectomy data: A preliminary report. *Plast Reconstr Surg* 59:53-56, Jan 1977
- Goldwyn RM: Subcutaneous mastectomy (Editorial). *N Engl J Med* 297:503-505, Sep 1, 1977

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